

WHAT IS CLAIMED IS:

1 1. A circuit for sensing an input supply voltage and providing a desired output
2 voltage, the circuit comprising:
3 a voltage sensing circuit, configured to sense, at least at a predetermined time, a
4 value of the input supply voltage and provide a voltage indication signal based on the supply
5 voltage, so sensed;
6 a control circuit, responsive to said voltage indication signal, that generates a
7 control signal; and
8 a switching element having a control terminal that receives said control signal;
9 said control signal being different for different first and second values of said
10 supply voltage, so sensed, wherein
11 said first value of said supply voltage, so sensed, is different from said
12 desired output voltage, and
13 said control signal is in the form of a pulse train for switching said switching
14 element for said first value of said supply voltage, so sensed.

1 2. The circuit of claim 1 wherein said predetermined time is at power-on.

1 3. The circuit of claim 1 wherein said desired output voltage is used to power
2 motors and logic in a hard disk drive.

1 4. The circuit of claim 1 wherein said first value of said sensed supply voltage is
2 lower than said second value of said sensed supply voltage.

1 5. The circuit of claim 1 wherein:
2 said second value of said sensed supply voltage is equal to said desired output
3 voltage; and
4 said control signal is in the form of a fixed level for said second value of said
5 supply voltage, so sensed.

1 6. The circuit of claim 5 wherein said fixed level is such as to keep said switching
2 element in an ON state.

1 7. The circuit of claim 5 wherein said fixed level is such as to keep said switching
2 element in an OFF state.

1 8. The circuit of claim 1, and further comprising a second switching element
2 having a control terminal, and wherein:

3 said control circuit is further configured to provide a second control signal based
4 on the supply voltage, so sensed, to said control terminal of said second switching element; and

5 said second control signal is such as to maintain said second switching element in
6 an ON state for one of said first and second values of said supply voltage and in an OFF state for
7 the other of said first and second values of said supply voltage.

1 9. The circuit of claim 8, and further comprising a third switching element having
2 a control terminal, and wherein:

3 said control circuit is further configured to provide a third control signal based on
4 the supply voltage, so sensed, to said control terminal of said third switching element; and

5 said third control signal is a pulse train for switching said third switching element
6 for one of said first and second values of said supply voltage, and a fixed level for the other of
7 said first and second values of said supply voltage.

1 10. A chipset for a hard disk drive comprising:

2 the circuit of claim 1; and

3 a motor control circuit powered by said desired output voltage from said circuit.

1 11. A hard disk drive comprising:

2 the circuit of claim 1;

3 a magnetic disk;

4 a spindle motor connected to said disk to rotate said disk upon the application of
5 power;

6 a head for reading and writing data from and to said disk;

7 a head motor connected to move said head across said disk upon the application
8 of power; and

9 a motor control circuit coupled to said spindle motor and said head motor to
10 control the application of power to said spindle motor and said head motor;
11 at least one of said spindle motor, a head motor, and motor control circuit
12 receiving power supplied by said circuit.

1 12. A circuit for powering a hard disk drive, the circuit comprising:
2 a voltage sensing circuit, configured to sense, at least at a predetermined time, a
3 supply voltage at an input node and provide a voltage indication signal based on the supply
4 voltage, so sensed;
5 at least one DC-DC conversion circuit, connected to said input node and to an
6 output node, for converting said supply voltage, so sensed, to a different desired output voltage
7 and providing said different voltage on said output node; and
8 a control circuit, coupled to said voltage sensing circuit and to said DC-DC
9 conversion circuit for controlling said DC-DC conversion circuit depending on said supply
10 voltage, so sensed.

1 13. A circuit for powering a hard disk drive, the circuit comprising:
2 a voltage sensing circuit, configured to sense, at least at a predetermined time, a
3 supply voltage at an input node and provide a voltage indication signal based on the supply
4 voltage, so sensed;
5 at least one DC-DC conversion circuit, connected to said input node and to an
6 output node, for converting said supply voltage, so sensed, to a different desired output voltage
7 and providing said different voltage on said output node;
8 a switchable pass-through path between said input node and said output node; and
9 a control circuit, coupled to said voltage sensing circuit, said DC-DC conversion
10 circuit, and said switchable pass-through path;
11 said control circuit controlling said DC-DC conversion circuit and said switchable
12 pass-through path so that:
13 when said voltage indication signal indicates that said supply voltage is
14 different from said desired output voltage, said control circuit
15 enables said DC-DC conversion circuit to supply said different
16 voltage on said output node, and

17 prevents said pass-through path from passing said supply voltage
18 to said output node; and
19 when said voltage indication signal indicates that said supply voltage is
20 equal to said desired output voltage, said control circuit
21 prevents said DC-DC conversion circuit from supplying said
22 different voltage on said output node, and
23 allows said pass-through path to pass said supply voltage to said
24 output node.

1 14. The circuit of claim 13 wherein said desired output voltage is greater than
2 said voltage sensed at said input node.

1 15. The circuit of claim 13 wherein said desired output voltage is less than said
2 voltage sensed at said input node.

1 16. The circuit of claim 13 wherein said DC-DC conversion circuit is a
2 switching regulator.

1 17. The circuit of claim 13 wherein said control circuit prevents said DC-DC
2 conversion circuit from supplying said different voltage on said output node by disabling said
3 DC-DC conversion circuit.

1 18. The circuit of claim 13 wherein said DC-DC conversion circuit includes a
2 switching element that is also located in said pass-through path.

1 19. A hard disk drive comprising:
2 a magnetic disk;
3 a spindle motor connected to said disk to rotate said disk upon the application of
4 power;
5 a head for reading and writing data from and to said disk;
6 a head motor connected to move said head across said disk upon the application
7 of power; and
8 a motor control circuit coupled to said spindle motor and said head motor to
9 control the application of power to said spindle motor and said head motor;

power distribution circuitry for connection to a power source solely through a two-pin connection to the power source, said connection providing a supply voltage between a voltage supply node and a ground node, said power distribution circuitry including:

a voltage sensing circuit, configured to sense, at least at a predetermined time, said supply voltage and provide a voltage indication signal based on the supply voltage, so sensed;

at least one DC-DC conversion circuit, connected to said voltage supply node and to an output node, for converting said supply voltage, so sensed, to a different desired output voltage and providing said different voltage on said output node; and

a control circuit, coupled to said voltage sensing circuit and to said DC-DC conversion circuit for controlling said DC-DC conversion circuit depending on said supply voltage, so sensed.

20. The circuit of claim 19 wherein:

said voltage supply node is at 5 volts;

at least one component of said hard disk drive requires a voltage greater than 5 volts; and

said DC-DC conversion circuit includes a switching regulator that converts 5 volts to a higher voltage.

21. The circuit of claim 19 wherein:

said voltage supply node is at 12 volts;

no components of said hard disk drive require a voltage greater than a predetermined voltage that is less than 12 volts; and

said DC-DC conversion circuit includes a switching regulator that converts 12 volts to a voltage that is less than 12 volts.

22. The circuit of claim 19 wherein:

said voltage supply node is at 12 volts;

no components of said hard disk drive require a voltage greater than a predetermined voltage that is less than 12 volts; and

5 said DC-DC conversion circuit includes a linear regulator that converts 12 volts to
6 a voltage that is less than 12 volts.